

1. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{8x^3 + 10x^2 - 9x - 9}{4x^2 + 23x + 15}$$

- A. Horizontal Asymptote at $y = -5.0$
 - B. Horizontal Asymptote of $y = -5.0$ and Oblique Asymptote of $y = 2x - 9$
 - C. Oblique Asymptote of $y = 2x - 9$.
 - D. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 9$
 - E. Horizontal Asymptote of $y = 2.0$
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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 + 38x^2 + 15x - 36}{16x^2 + 8x - 15}$$

- A. Holes at $x = -1.25$ and $x = 0.75$ with no vertical asymptotes.
 - B. Vertical Asymptote of $x = -1.25$ and hole at $x = 0.75$
 - C. Vertical Asymptotes of $x = -1.25$ and $x = -1.5$ with a hole at $x = 0.75$
 - D. Vertical Asymptote of $x = 0.5$ and hole at $x = 0.75$
 - E. Vertical Asymptotes of $x = -1.25$ and $x = 0.75$ with no holes.
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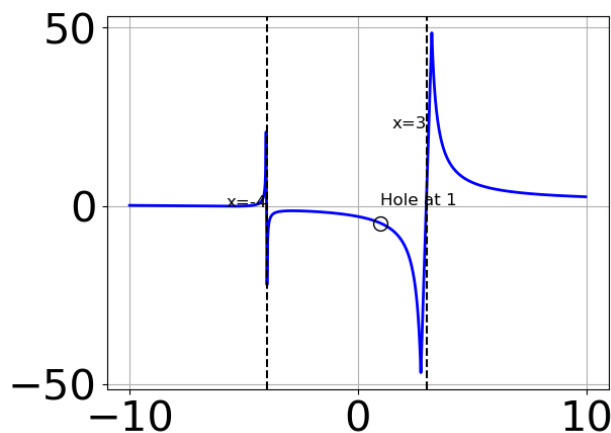
3. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 - 29x^2 + 43x - 20}{-4x^3 + 28x^2 - 38x + 20}$$

- A. Vertical Asymptote of $y = 2.000$
- B. Horizontal Asymptote of $y = 0$
- C. Horizontal Asymptote of $y = -1.500$

- D. None of the above
- E. Vertical Asymptote of $y = 1$

4. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 + 11.0x^2 + 23.0x - 35.0}{x^3 - 13.0x + 12.0}$
- B. $f(x) = \frac{x^3 - 5.0x^2 - 49.0x + 245.0}{x^3 - 13.0x - 12.0}$
- C. $f(x) = \frac{x^3 - 11.0x^2 + 23.0x + 35.0}{x^3 - 13.0x - 12.0}$
- D. $f(x) = \frac{x^3 + 18.0x^2 + 107.0x + 210.0}{x^3 - 13.0x + 12.0}$
- E. None of the above are possible equations for the graph.

5. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 - 1x^2 - 38x + 24}{8x^2 - 18x + 9}$$

- A. Vertical Asymptotes of $x = 1.5$ and $x = 0.75$ with no holes.
- B. Holes at $x = 1.5$ and $x = 0.75$ with no vertical asymptotes.
- C. Vertical Asymptotes of $x = 1.5$ and $x = 1.333$ with a hole at $x = 0.75$

D. Vertical Asymptote of $x = 1.5$ and hole at $x = 0.75$

E. Vertical Asymptote of $x = 1.5$ and hole at $x = 0.75$

6. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 - 31x^2 + 48x - 20}{3x^2 - 14x + 8}$$

A. Horizontal Asymptote of $y = 4.0$ and Oblique Asymptote of $y = 2x - 1$

B. Horizontal Asymptote at $y = 4.0$

C. Oblique Asymptote of $y = 2x - 1$.

D. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 1$

E. Horizontal Asymptote of $y = 2.0$

7. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^2 + 13x - 15}{18x^3 - 9x^2 - 17x + 10}$$

A. Horizontal Asymptote of $y = 0.333$ and Oblique Asymptote of $y = 3x - 8$

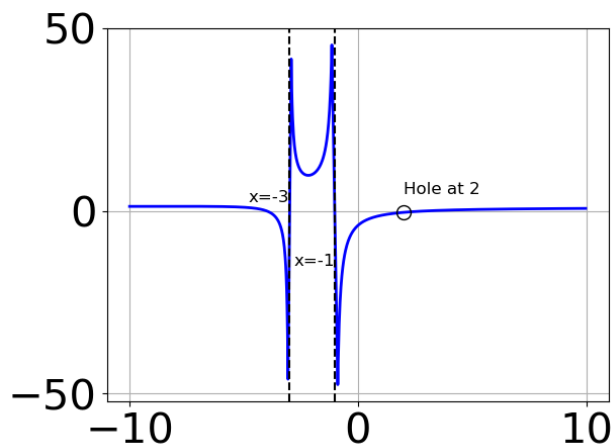
B. Oblique Asymptote of $y = 3x - 8$.

C. Horizontal Asymptote of $y = 0.333$

D. Horizontal Asymptote of $y = 0$

E. Horizontal Asymptote at $y = -3.000$

8. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 + x^2 - 14.0x - 24.0}{x^3 - 2.0x^2 - 5.0x + 6.0}$
- B. $f(x) = \frac{x^3 - 4.0x^2 - 17.0x + 60.0}{x^3 + 2.0x^2 - 5.0x - 6.0}$
- C. $f(x) = \frac{x^3 - 1.0x^2 - 14.0x + 24.0}{x^3 + 2.0x^2 - 5.0x - 6.0}$
- D. $f(x) = \frac{x^3 - 7.0x^2 - 6.0x + 72.0}{x^3 - 2.0x^2 - 5.0x + 6.0}$
- E. None of the above are possible equations for the graph.

9. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 - 42x^2 + 63x - 27}{6x^2 - 5x - 6}$$

- A. Vertical Asymptotes of $x = -0.667$ and $x = 1.5$ with no holes.
- B. Holes at $x = -0.667$ and $x = 1.5$ with no vertical asymptotes.
- C. Vertical Asymptotes of $x = -0.667$ and $x = 0.75$ with a hole at $x = 1.5$
- D. Vertical Asymptote of $x = 1.333$ and hole at $x = 1.5$
- E. Vertical Asymptote of $x = -0.667$ and hole at $x = 1.5$

10. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 19x^2 - 45x + 100}{9x^2 - 21x + 10}$$

- A. Vertical Asymptote of $x = 0.667$ and hole at $x = 1.667$
 - B. Vertical Asymptote of $x = 0.667$ and hole at $x = 1.667$
 - C. Holes at $x = 0.667$ and $x = 1.667$ with no vertical asymptotes.
 - D. Vertical Asymptotes of $x = 0.667$ and $x = -2.5$ with a hole at $x = 1.667$
 - E. Vertical Asymptotes of $x = 0.667$ and $x = 1.667$ with no holes.
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